

**Alaska Department of Fish and Game
Wildlife Restoration Grant**

Grant Number: W-33

Segment Number: 10

Project Number: 1.68

Project Title: Factors affecting moose forage quality and subsequent reproductive success.

Project Duration: 1 July 2009 to 30 June 2014

REPORTING PERIOD: 1 July 2011 to 30 June 2012

Report Due Date: 1 September 2012.

PRINCIPAL INVESTIGATOR: William B. Collins

WORK LOCATION: Matanuska Research Farm, Togiak Valley, Colville River, Nelchina Basin,
Game Management Unit 15

I. PROGRESS ON PROJECT OBJECTIVES DURING LAST SEGMENT

OBJECTIVE 1: Nitrogen as a potentially limiting nutrient to moose.

We have made steady progress in measuring digestible protein across a variety of moose ranges in Alaska. During this period, we completed the last forage collection of this project and we have analyzed most of the samples for nitrogen and tannins.

OBJECTIVE 2: Effects of climate and utilization on browse quality.

We established a set of controlled experiments which will enable us to begin assessing the effects of soil temperature, soil fertility, soil moisture, and solar radiation on the productivity and quality of two important willow forages—an upland species, *Salix pulchra*, and a riparian species, *Salix alaxensis*. We cloned 128 plants of each species and subjected them to all 4 treatments for this period.

OBJECTIVE 3: Hormonal link between diet quality and reproductive performance.

We completed analyses of the effects of nutrition on production of ghrelin, leptin, and corticosterone, which in turn, affect the production of progesterone and reproductive performance. We summarized the results and began preparing a manuscript for publication.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB/ACTIVITY 1: Moose forage nitrogen and protein binding

We completed our second sampling of forages in the Colville drainage and continued analyzing samples.

JOB/ACTIVITY 2: Diets by fecal alkane analysis

We completed analysis of moose diets and began preparing a manuscript for publication.

JOB/ACTIVITY 3: Climate/utilization effects—potted willows

Treatments have been maintained during the 2012 growing season without problems of root competition with other plants. This makes it possible for us to collect our first set of tissue samples in August 2012.

JOB/ACTIVITY 4: Hormonal link

We completed data analysis and began preparation of a manuscript.

JOB/ACTIVITY 5: Forage availability by remote sensing

Two manuscripts based on remote sensing of Nelchina and Placer Valley habitats have passed through peer review and are submitted for final approval.

V. PUBLICATIONS

Murielle Lauper, Isabel Lechner, Perry S. Barbozab, William B. Collins, Jürgen Hummel, Daryl Codron, Marcus Clauss. In Press. Ruminantion of different-sized particles in muskoxen (*Ovibos moschatus*) and moose (*Alces alces*) on grass and browse diets, and implications for ruminantion in different ruminant feeding types.

Walton, K., D. Spalinger, N. Harris, and W. Collins. In review. High Spatial Resoultion Vegetation Mapping of Wildlife Habitat.

VI. RECOMMENDATIONS FOR THIS PROJECT

Continue as planned

Prepared by: William B. Collins

Date: 14 August 2012